



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,366	07/27/2001	Yasuhito Suzuki	50090-309	6983

7590 11/17/2003

McDermott, Will & Emery
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER

VU, QUANG D

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,366

Applicant(s)

SUZUKI ET AL.

Examiner

Quang D Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 09/22/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 2811

DETAILED ACTION

Upon further consideration of the claim language, the indication of allowable subject matter of claims 5-8 is hereby withdrawn. A full explanation is provided herein below. Any inconvenience is sincerely regretted.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,518,659 to Glenn.

Regarding claim 1, Glenn (figure 3) teaches a semiconductor package comprising:

a die pad (17);

a die (28) mounted on the die pad (17);

a plurality of outer leads (21) electrically connected to electrodes (bond pad [29]) of the die (28) by bonding wires (30), respectively; and

Art Unit: 2811

a sealing member (11) sealing the die (28), the bonding wires (30), parts of the outer leads (21) and a part of the die pad (17), and having an upper surface on the side of the die (28) and a lower surface on the side of the die pad (17);

wherein the outer leads (21) have upper electrical connecting surfaces on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]), and lower electrical connecting surfaces on the side of the lower surface of the sealing member (a lower portion of the encapsulant [11]), respectively, and the outer leads (21) extend at least from a plane including the lower surface of the sealing member (a lower portion of the encapsulant [11]) to beyond that of the upper surface of the sealing member (an upper portion of the encapsulant [11]).

Regarding claim 2, Glenn teaches the upper electrical connecting surfaces of the outer leads (21) formed on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]) lie outside a projection region of the upper surface of the sealing member (an upper portion of the encapsulant [11]).

Regarding claim 4, Glenn teaches the outer leads (21) are formed in an L-shape.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2811

4. Claims 3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,518,659 to Glenn.

The disclosures of Glenn are discussed as applied to claims 1-2 and 4 above.

Regarding claim 3, Glenn teaches the sealing member has four sides (column 3, lines 62-67). Glenn differs from the claimed invention by not showing the outer leads are formed on the four sides of the sealing member. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the outer leads are formed on the four sides of the sealing member because they increase the number of external connections between the die and the external circuit.

Regarding claim 5, Glenn (figure 3) teaches a semiconductor package comprising:

a die pad (17);

a die (28) mounted on the die pad (17);

a plurality of outer leads (21) electrically connected to electrodes (bond pad [29]) of the die (28) by bonding wires (30), respectively; and

a sealing member (11) sealing the die (28), the bonding wires (30), parts of the outer leads (21) and a part of the die pad (17), and having an upper surface on the side of the die (28) and a lower surface on the side of the die pad (17);

wherein the outer leads (21) have upper electrical connecting surfaces on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]), and lower electrical connecting surfaces on the side of the lower surface of the sealing member (a lower portion of the encapsulant [11]), respectively, and the outer leads (21) have a height from a plane including the lower surface of the sealing member (a lower portion of the encapsulant [11])

Art Unit: 2811

greater than that of the upper surface of the sealing member (an upper portion of the encapsulant [11]).

Glenn differs from the claimed invention by not showing a printed wiring board in the embodiment of figure 3. However, Glenn teaches a printed circuit board (31) in the embodiment of figure 2. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a printed circuit board of the embodiment of figure 2 into the embodiment of figure 3 because it is desirable securely to holds the package in place.

Glenn further differs from the claimed invention by not showing a plurality of semiconductor packages stacked up on the printed wiring board with outer leads included therein in the embodiment of figure 3. However, Glenn teaches a plurality of semiconductor packages stacked up on the printed circuit board (31) with outer leads (21) included therein in the embodiment of figure 2. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a plurality of semiconductor packages stacked up on the printed circuit board of the embodiment of figure 2 into the embodiment of figure 3 because it accommodates the size and thickness of the package device. The combined device shows a printed wiring board; and a plurality of semiconductor packages stacked up on the printed wiring board with outer leads included therein.

Regarding claim 6, Glenn teaches the upper electrical connecting surfaces of the outer leads (21) formed on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]) lie outside a projection region of the upper surface of the sealing member (an upper portion of the encapsulant [11]).

Art Unit: 2811

Regarding claim 7, Glenn teaches the sealing member has four sides (column 3, lines 62-67). Glenn differs from the claimed invention by not showing the outer leads are formed on the four sides of the sealing member. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the outer leads are formed on the four sides of the sealing member because they increase the number of external connections between the die and the external circuit.

Regarding claim 8, Glenn teaches the outer leads (21) are formed in an L-shape.

Regarding claim 9, Glenn (figure 3) teach a semiconductor package comprising:

a die pad (17);

a die (28) mounted on the die pad (17);

a plurality of outer leads (21) electrically connected to electrodes (bond pad [29]) of the die (28) by bonding wires (30), respectively; and

a sealing member (11) sealing therein the die (28), the bonding wires (30), parts of the outer leads (21) and a part of the die pad (17), and having an upper surface on the side of the die (28) and a lower surface on the side of the die pad (17);

wherein the outer leads (21) have upper electrical connecting surfaces on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]), and lower electrical connecting surfaces on the side of the lower surface of the sealing member (a lower portion of the encapsulant [11]), respectively, and the outer leads (21) have a height from a plane including the lower surface of the sealing member (a lower portion of the encapsulant [11]) greater than that of the upper surface of the sealing member (an upper portion of the encapsulant [11]).

Art Unit: 2811

Glenn differs from the claimed invention by not showing a printed wiring board in the embodiment of figure 3. However, Glenn teaches a printed circuit board (31) in the embodiment of figure 2. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a printed circuit board of the embodiment of figure 2 into the embodiment of figure 3 because it is desirable securely to hold the package in place.

Glenn further differs from the claimed invention by not showing a plurality of semiconductor packages, stacked up on the printed wiring board with outer leads included therein in the embodiment of figure 3. However, Glenn teaches a plurality of semiconductor packages stacked up on the printed circuit board (31) with outer leads (21) included therein in the embodiment of figure 2. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a plurality of semiconductor packages stacked up on the printed circuit board of the embodiment of figure 2 into the embodiment of figure 3 because it accommodates the size and thickness of the package device. The combined device shows a printed wiring board; and a plurality of semiconductor packages stacked up on the printed wiring board with outer leads included therein.

Regarding claim 10, Glenn teaches the upper electrical connecting surfaces of the outer leads (21) formed on the side of the upper surface of the sealing member (an upper portion of the encapsulant [11]) lie outside a projection region of the upper surface of the sealing member (an upper portion of the encapsulant [21]).

Regarding claim 11, Glenn teaches the sealing member has four sides (column 3, lines 62-67). Glenn differs from the claimed invention by not showing the outer leads are formed on the four sides of the sealing member. It would have been obvious to one having ordinary skill in the

Art Unit: 2811

art at the time the invention was made for the outer leads are formed on the four sides of the sealing member because they increase the number of external connections between the die and the external circuit.

Regarding claim 12, Glenn teaches the outer leads (21) are formed in an L-shape.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn in view of US Patent No. 5,585,671 to Nagesh et al.

Regarding claim 13, the disclosures of Glenn are discussed as applied to claims 3 and 5-12 above.

Glenn differs from the claimed invention by not showing the die pad of the semiconductor package is provided on its exposed surface with a cooling fin. However, Nagesh et al. (figures 1, 3, 3A) teach the heat sink (32), which is provided on the die pad (20) of the semiconductor chip (12). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Nagesh et al. into the device taught by Glenn because it dissipates heat from the die.

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

qv
November 13, 2003



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800